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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,196	09/19/2001	Hiroto Hirakoso	SON-2213	9433

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EXAMINER

TUCKER, WESLEY J

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/955,196

Applicant(s)

HIRAKOSO, HIROTO

Examiner

Wes Tucker

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments and Amendments

1. Applicant's response to the last Office Action, filed November 30th, 2004 has been entered and made of record.
2. Applicant has amended claims 1 and 2 and added new claims 5-8. Claims 1-8 are pending.
3. Applicant's arguments, with respect to the rejection(s) of claim(s) 1-4 have been considered and are not persuasive for at least the following reasons:
4. Applicant argues that the combination of references to Okada and Nakami do not teach or fairly suggest determining an interpolation function by composing a function based on a cubic convolution method and a function based on a bilinear method with regard to claims 1 and 3. Applicant points out that the methods of Okada and Nakami only show conventional filters with four taps and Examiner appreciates the distinction. Applicant also discusses the use of conventional taps the need of the number of pixels and the reduction of the size of the circuit that can be realized through the present invention. However nothing in the claims points to the number of taps, required pixels or the reduction of the scale of the circuit used. Therefore broadly interpreted the combination of Okada and Nakami is deemed to read on the limitations of the claims. The hybrid bi-cubic function of Makami is interpreted as a hybrid and is therefore certainly obtained by composing a function based on a cubic convolution

method and a function based on a bilinear method because it is a hybrid and is determined as a combination of a bilinear and cubic function. The two references are deemed to be combinable because they are both in the environment of interpolating images and Nakami teaches the advantages of using a hybrid of the two methods.

5. With regard to claims 2 and 4 Applicant argues that the function disclosed in Nakami is not asymmetric with respect to the right and left and that Nakami's function is actually symmetric and only the right side of the function is shown. However Examiner points out that this broadly interpreted is asymmetric as pictured and that claims 2 and 4 should be written to clearly claim where asymmetry is claimed such as asymmetric in reference to either side of the origin rather than broadly right and left.

6. Again Applicant argues that the interpolation method results in an interpolation function having high frequency-band emphasis, a reduced number of taps, and a reduction in the scale of circuitry. None of said results are claimed in the claims. As the claims stand the combination of the references to Okada and Nakami is deemed to read on the limitations of said claims. Therefore the rejection has been maintained and accordingly made final.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2623

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,704,463 to Okada et al. and U.S. Patent 6,510,254 to Nakami et al.

9. With regard to claim 1, Okada discloses an image processing method for enlarging or reducing a digital image, characterizes in that interpolation signals between discrete original pixels used for calculating an output pixel value are calculated by an FIR digital filter using as an interpolation function based on either a cubic convolution method or a bilinear method (column 2, lines 61-65 and column 3, lines 14-20 and Fig. 11), but does not disclose using a function obtained by composing both cubic convolution and bilinear methods.

Nakami discloses a function for interpolation based on composing a function based on a cubic convolution method and a function based on a bilinear method (Fig. 19). Nakami teaches that this hybrid (bilinear/cubic) bicubic function is useful in increasing the sharpness of the image (column 12, lines 25-30). Nakami also teaches that the amount of computation is becomes increasingly larger for the cubic method and that the trade off between image quality/sharpness and processing speed is optimal using the bicubic function (column 12, lines 30-39). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the bicubic function as an optimal choice for interpolating in the method of Okada in order to

maintain image quality/sharpness while reducing computation time as taught by Nakami.

10. With regard to claim 2, the combination of Okada and Nakami disclose the image processing method as claimed in claim 1, wherein said FIR filter uses as an interpolation function, a function that is obtained by composing a part of the function based on the cubic convolution method and a part of the function based on the bilinear method. Nakami further discloses where the interpolation is asymmetric with respect to the right and left (Fig. 19).

11. With regard to claim 3, the discussion of claim 1 applies. Okada discloses an apparatus to be used with his method (Fig. 1).

12. With regard to claim 4, the discussion of claim 2 applies. Nakama discloses an apparatus (Fig. 2) and discloses the asymmetric interpolation function (Fig. 19).

13. With regard to claim 5, Okada and Nakami disclose the method as claimed in claim 1, and they are both considered to disclose that the method is for use in enlarging or reducing the digital image because that is what interpolation is inherently used for. When interpolation is performed pixels are created or reversely they are deleted inherently expanding or decreasing the image.

14. With regard to claim 6, the discussion of claim 5 applies.

15. With regard to claim 7, the discussion of claim 3 and claim 1 apply. Both the references to Okada and Nakami are interpreted to operate as electronic devices (Okada Fig. 1 and Nakami Fig. 2).

16. With regard to claim 8, the discussion of claim 5 applies.

Conclusion

17. Applicant's amendment necessitated the new grounds of rejection presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on Monday-Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 571-272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

5-25-05



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